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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,994	11/21/2001	Tetsuya Hori	500.40886X00	9525

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EXAMINER

GENCO, BRIAN C

ART UNIT	PAPER NUMBER
2615	15

DATE MAILED: 06/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/988,994	HORI ET AL.
Examiner	Art Unit	
Brian C Genco	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on ____.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 15-23 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
 5) Claim(s) ____ is/are allowed.
 6) Claim(s) 15-23 is/are rejected.
 7) Claim(s) ____ is/are objected to.
 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 11) The proposed drawing correction filed on ____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.
 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413) Paper No(s). 14.
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) Notice of Informal Patent Application (PTO-152)
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ . 6) Other:

Applicants arguments filed April 18, 2003 have been fully considered by the Examiner but are not deemed persuasive.

Examiner notes that on page 6 Applicants remarks reference to Figs. 1A and 1B were made. Examiner notes that there are no Figs. 1A and 1B, as such Examiner is interpreting these references to mean figures 2A and 2B. Further, Examiner notes that Applicants remarks on page 6 do not seem to be consistent with Applicants disclosure, namely page 10, line 23 to page 11, line 10 and page 12, line 18 to page 13, line 2. Specifically in Applicants remarks at the bottom of page 6 Applicant describes two different modes of operation lumped together. The first mode is disclosed on page 10, line 23 to page 11, line 10 wherein there is only one pixel shift so as to generate a monochromatic green image only. The other mode is described on page 11, line 28 – page 13, line 16 wherein a monochromatic image for any of red, blue or green can be generated by shifting the pixels by a 1/n pixel pitch a plurality of times.

Applicant argues that neither Howell nor Hamada disclose or suggest the features taught in the above mentioned passages of Applicant's disclosure.

In response, Examiner disagrees and presents grounds of rejection supporting why these features are taught by Howell and Hamada below.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 15-23 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In regards to claims 15 and 21 applicant claims in claim 15 generating “a single monochromatic image using data of obtained plurality of images and image data of the synthesized image”, wherein the synthesized image is generated by extracting a color image data obtained before and after a shift operation and similarly in claim 21. Examiner notes that the specification does not disclose this process. In contrast, as shown in Fig. 3 and described on page 11, lines 11-27 Applicant discloses generating an image, extracting a color, shifting the pixels, generating another image, extracting the same color, then if a plurality of shifts are to be made shifting and repeating the generation and extraction process n times. After this an interpolated or synthesized image is created based on the plurality of extracted color images and subsequently a monochromatic image is output. In looking at Figs. 2A-2C, the image of Fig. 2A is taken, the green image shown on the left hand side of the arrows in Fig. 2B is extracted, the pixels are shifted and the image of Fig. 2A is again taken and the green image shown on the right hand side of the arrows in Fig. 2B is extracted, a synthesized image is created by combining those two images into the image shown in Fig. 2B and that is output as the monochromatic image. **Alternatively** (emphasis added), one could perform the shifting and extracting process a plurality of times to generate a higher resolution monochromatic image. As is currently claimed one would perform the process to generate Fig. 2B, or the synthesized image, then one would perform all of the steps of gathering the data to generate the image of Fig. 2C, then one would

generate the monochromatic image based on all the data gathered to generate the image of Fig. 2C and the synthesized image of Fig. 2B. As is abundantly clear to anyone skilled in the art this is not the invention described in Applicants specification.

Claims 16-20, and 22-23 are dependent upon claims 15 and 21.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 20 recites the limitation "selected color of three colors" in claim 20, line 3 on page 3 of Applicants amendment. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 15-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over (USPN 6,046,772 to Howell) in view of (USPN 5,960,128 to Hamada).

In regards to claim 15 Howell discloses an image processing apparatus comprising:
an image optical system for forming an image of an object on an imaging surface (e.g., Fig. 8);
a color imaging device including photo-detectors and color filters arranged on the image surface in two-dimensions, for performing photoelectric conversion of the image of the object formed by the imaging optical system (e.g., Fig. 6);

shift drive means for shifting the imaging optical system and the photodetectors relative to each other (e.g., Fig. 6); and

a control unit for generating a synthesized image using image data of the image of the object obtained through color filters for a selected color of the color imaging device, and image data of an image of the object obtained through the color filters when the imaging optical system and the photo-detectors are shifted relative to each other by the shift drive means by a distance corresponding to a pixel on the imaging surface (e.g., Fig. 6);

Howell does not disclose nor preclude the shift drive means for shifting the image optical system the photo-detectors relative to each other by a distance corresponding to a predetermined pitch in a plurality of different directions to obtain a plurality of images, and generates a single monochromatic image using image data of obtained plurality of images and image data of the synthesized image.

Hamada discloses shifting an image sensor and an optical system relative to each other a plurality of different directions to generate a single image using the data of the plurality of images as shown in Figs. 5A-5P in order to generate an image of high resolution (column 3, lines 34-42). Examiner notes that shifting Hamada's image sensor as depicted in Figs. 5A and 5C generates the synthesized data as disclosed by Howell, wherein all of the other figures generate the claimed plurality of images. Therefore it would have been obvious to additionally shift Howell's image sensor a plurality of times as disclosed by Hamada in order to generate an image of higher resolution.

In regards to claim 16 Howell discloses an image processing apparatus according to claim 15, wherein the color filters for three colors are arranged according to a Bayer Scheme (e.g., Fig. 6).

In regards to claim 17 Howell in view of Hamada discloses an image processing apparatus according to claim 15, wherein the predetermined pitch is a distance corresponding to $1/n$ (n is an integer) of a pixel on the imaging surface (e.g., see examiners notes on the rejection of claim 1. Howell discloses shifting wherein $n=1$ and Hamada discloses shifting wherein $n=2$).

In regards to claim 18 Hamada discloses an image processing apparatus according to claim 17, wherein the control unit repeats shifting by the distance corresponding to $1/n$ (n is an integer) of the pixel on the imaging surface a plurality of number of times (e.g., see examiners notes on the rejection of claim 1. Hamada discloses shifting wherein $n=2$).

In regards to claim 19 Howell in view of Hamada discloses an image processing apparatus according to claim 18, wherein the control unit obtains N images, when the predetermined number of times is N (e.g., see examiners notes on the rejection of claim 1. Howell discloses $N=2$ and Hamada discloses $N=16$).

In regards to claim 20 Howell discloses an image processing apparatus according to claim 15, wherein the selected color of three colors is green (e.g., Fig. 6 of Howell's disclosure).

In regards to claim 21-23 see examiners notes on the rejections above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian C. Genco who can be reached by phone at 703-305-7881 or

Art Unit: 2615

by fax at 703-746-8325. The examiner can normally be reached on Monday thru Friday 8:00am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center 2600 customer service office whose telephone number is 703-306-0377.

Brian C Genco
Examiner
Art Unit 2615

May 30, 2003



ANDREW CHRISTENSEN
SUPERVISORY PATENT EXAMINER
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